

DETAILED ACTION

Drawings

Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Beasom (US Pat. No. 5,895,953).

Beasom, figs. 1-10 and text on col. 1-8 discloses the claimed electronic power device including a carrier recombination zone (fig. 4e, silicide layer 211, col. 5, lines 25-29) located between the substrate 213 and the first thin layer 220 made of a semiconductor material and in which an active part 215 is formed, wherein the carrier

recombination zone 211 provides a resistive electric contact between the substrate 213 and the first thin layer 220 (figs. 4a-4e and related text on col. 4-5). See also figs. 5, 6 for the similar structures.

With respect to claims 2, 4, 5, 6, the carrier recombination zone is a second thin metal silicide layer which is an alloy and stable with respect to the materials in which the substrate 213 and the first thin layer 220 are respectively made.

With respect to claim 3, fig. 5 shows the two sides of the first thin layer 320 are treated to form active zones 319, 325 of the device.

With respect to claims 7, 8 fig. 5 shows the substrate includes a highly doped semiconductor region 326 and the carrier recombination zone is a metal silicide which is a stable alloy with the highly doped semiconductor region 326.

With respect to claims 9, 10, the silicide layer 311 acted as a recombination zone in fig. 5 is considered as a part of the substrate.

Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Neilson et al. (US Pat. No. 6,054,369).

Ogino, figs. 2-3 and related text on col. 3-5 discloses the claimed electronic power device including an active parts (doped P, N+ regions on top of layer 22 in figs. 2b) formed in a first thin semiconductor layer 22; a carrier recombination zone in layer 24 located between the highly doped N+ semiconductor substrate and the first thin semiconductor layer 22, wherein the carrier recombination zone in layer 24 provides a

resistive electric contact between the N⁺ substrate and the first thin semiconductor layer 22.

With respect to claim 2, the carrier recombination zone is in a second thin layer 24 made of an electrically conductive material (by implanting metal dopants, see col. 4, lines 36-44) which ensures electrically conductive bonding 20 between the substrate and the first thin layer 22.

With respect to claim 3, the two sides of the first thin layer 22 are treated to form active zones N⁻, P, N⁺ of the device.

With respect to claims 4-8, since the recombination zone is made by implanting with heavy metal dopant into semiconductor substrate and heat treated (col. 4, last paragraph); therefore it is resulted in metal alloy which is stable with respect to the materials in which the substrate and the first thin layer 22 are respectively made.

With respect to claim 9-10, the substrate is implanted with metal to form the recombination zone; therefore, the substrate is a metal and the carrier recombination zone made of metal in layer 24 is part of the substrate.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Response to Arguments

Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TUAN H. NGUYEN whose telephone number is (571)272-1694. The examiner can normally be reached on M-TH, 6:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TUAN H. NGUYEN/

Primary Examiner, Art Unit 2813